6th Symposium on the Impacts of an Ice-Diminishing Arctic on Naval and Maritime Operations

U.S. Navy Arctic Roadmap Update

RADM Jonathan White
Oceanographer and Navigator of the Navy

15 July 2015

Arctic Ice Minimum Projection

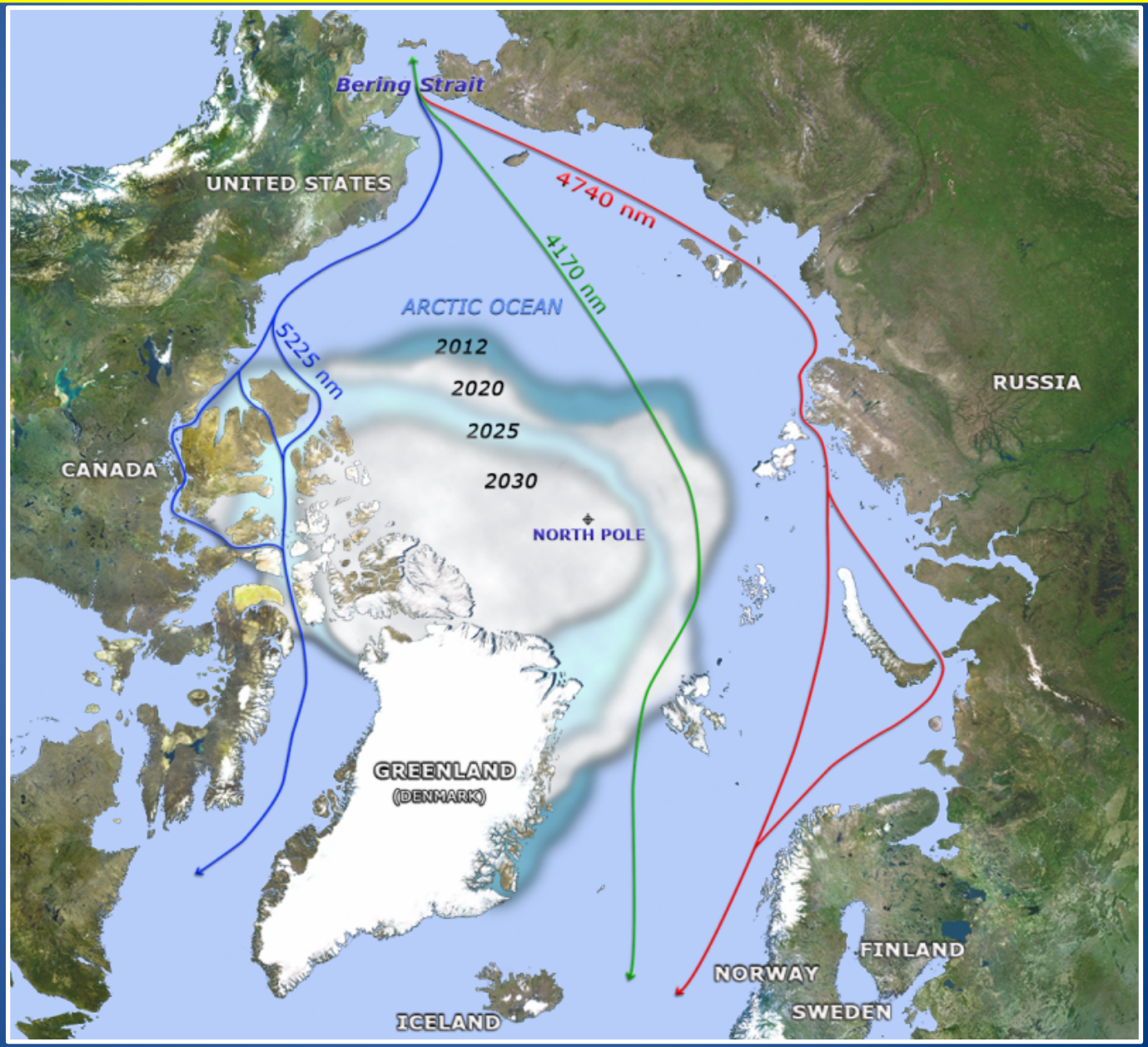
Sea Routes

Northern Sea Route
2025: 6 weeks open
41' controlling draft

Transpolar Route
2025: 2 weeks open
Deep ocean transit

Northwest Passage
2025: intermittently open
33' controlling draft

Sea route distances:
Distance from the Bering Strait to Rotterdam



Key Missions – Navy in the Arctic

- **Ensure U.S. sovereignty**
  - Defend the homeland
  - Contribute to maritime domain awareness
- **Ensure freedom of the seas**
- **Support the Coast Guard and other partners**
  - Search and Rescue *in support of missions led by USCG and as directed in support of international partners*
  - Environmental Response
  - Disaster Response/Defense Support of Civil Authorities

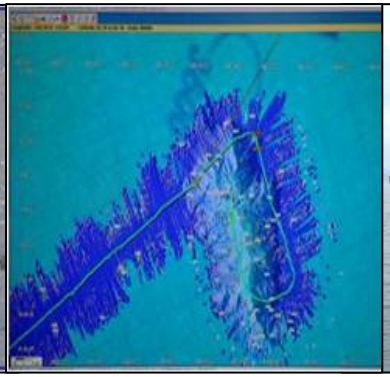
In the near to mid-term, the Navy will concentrate on improving operational capabilities, expertise, and capacity, extending reach, and will leverage interagency and international partners to achieve its strategic objectives

Arctic Challenges

Lack of:

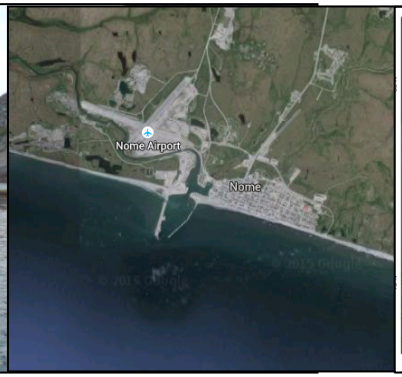
- Aids to Navigation
- Ocean Bottom Surveys for Charts
- Accurate Weather Forecasts & Sea-ice Prediction
- Reliable Satellite Communications
- Fuel and Supply Depots
- Medical Facilities
- Search & Rescue Capabilities & Infrastructure
- Oil Spill Response Capabilities

Limited ice- breaking capabilities

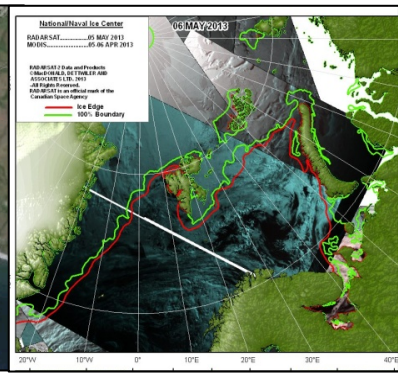


Incomplete charting

Limited SAR assets

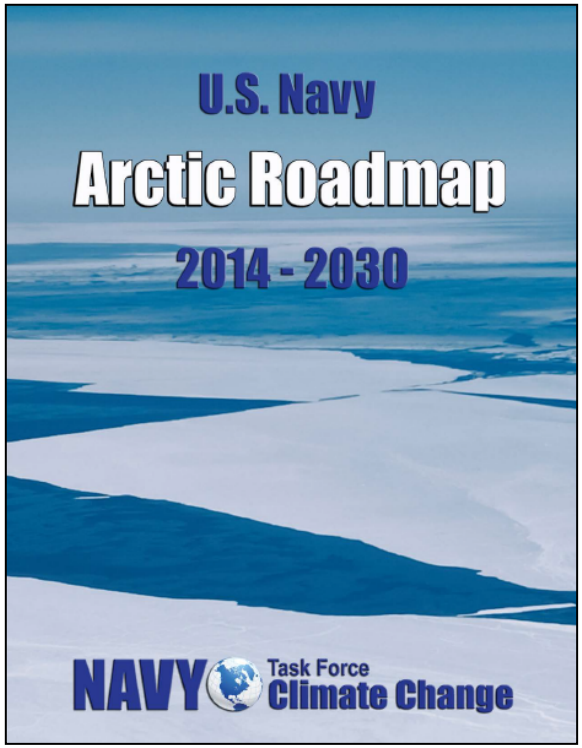


Limited Infrastructure



WX & Ice Prediction

Arctic Roadmap Update



Goal: Sustainable, Arctic-capable force recognizing partnerships are the foundation

- **Near-term** (2014-2020)
  - Refine doctrine, operating tactics & procedures
  - Enhance relationships
  - Joint international exercises, science & personnel exchanges
- **Mid-term** (2020-2030)
  - Provide operational support
  - Transition Arctic operations capability to sustained missions
  - Improve capabilities by participating in complex exercises
- **Long-term** (2030 and beyond)
  - Provide trained and equipped personnel and capabilities
  - Increased potential for SAR
  - Focus on maritime security and freedom of navigation

Arctic Roadmap Implementation

Highlights:

- Arctic Maritime Capability Requirements
- Arctic Engagement
- Update Fleet Guidance for Arctic Operations & Training
- ICEX Accelerated to Bi-annual Event
- Science and Technology Plan
- Identify / Evaluate U.S. & International Infrastructure
- Arctic Hull, Propulsion and Engineering Requirements
- International Arctic Region Hydrographic Commission → Charting Plan

Navy's National Role

Executive Order 13689
21 Jan 2015
Established Arctic ESC

DOD Lead:

Develop a Framework of Observations and Modeling to Support Forecasting and Prediction of Sea Ice

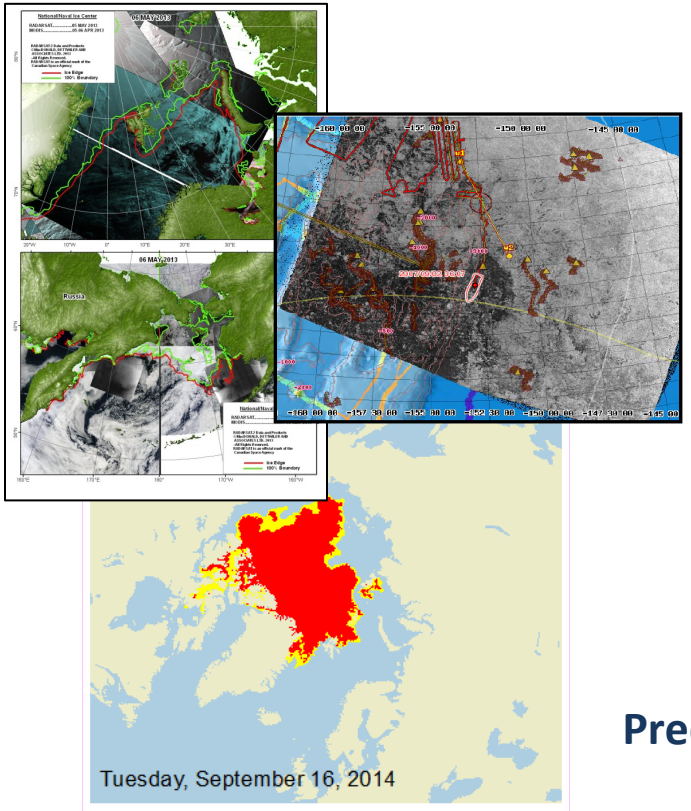
- **Objective: Improve sea ice forecasts and predictions at a variety of spatial and temporal scales**

***DOD Support*: Charting, Models, Maritime Domain Awareness, Observations, etc.**

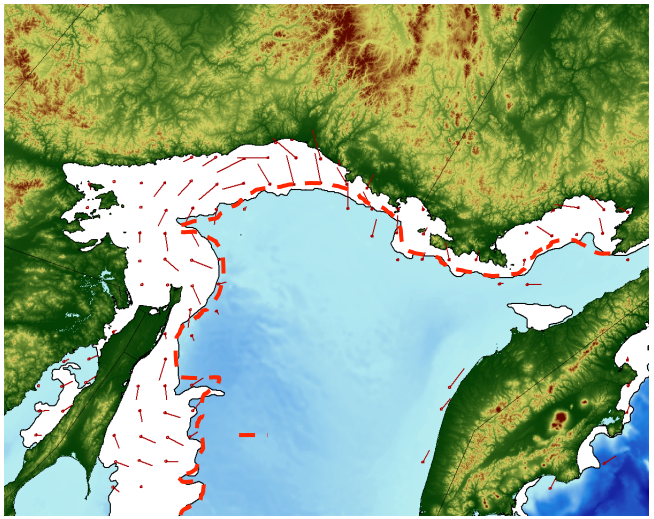
Under Title 10 the Navy is responsible "for safety and effectiveness of all maritime vessels, aircraft, and forces of the armed forces by means of: marine data collection, numerical modeling and forecasting hazardous weather and ocean conditions. As well as the collection and processing of Hydrographic Information."

Roadmap to Improved Arctic Forecasting Capability

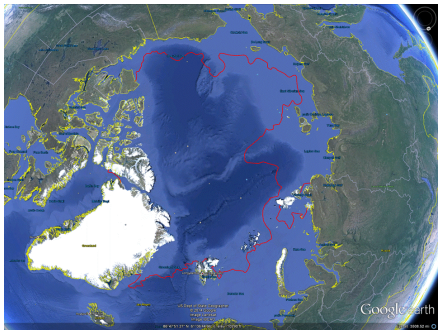
Analyze: Ice edge position and MIZ extent



Predict: Arctic Cap Nowcast/Forecast System (ACNFS)



Predict: 2-Day Ice Edge Outlook



International Engagement

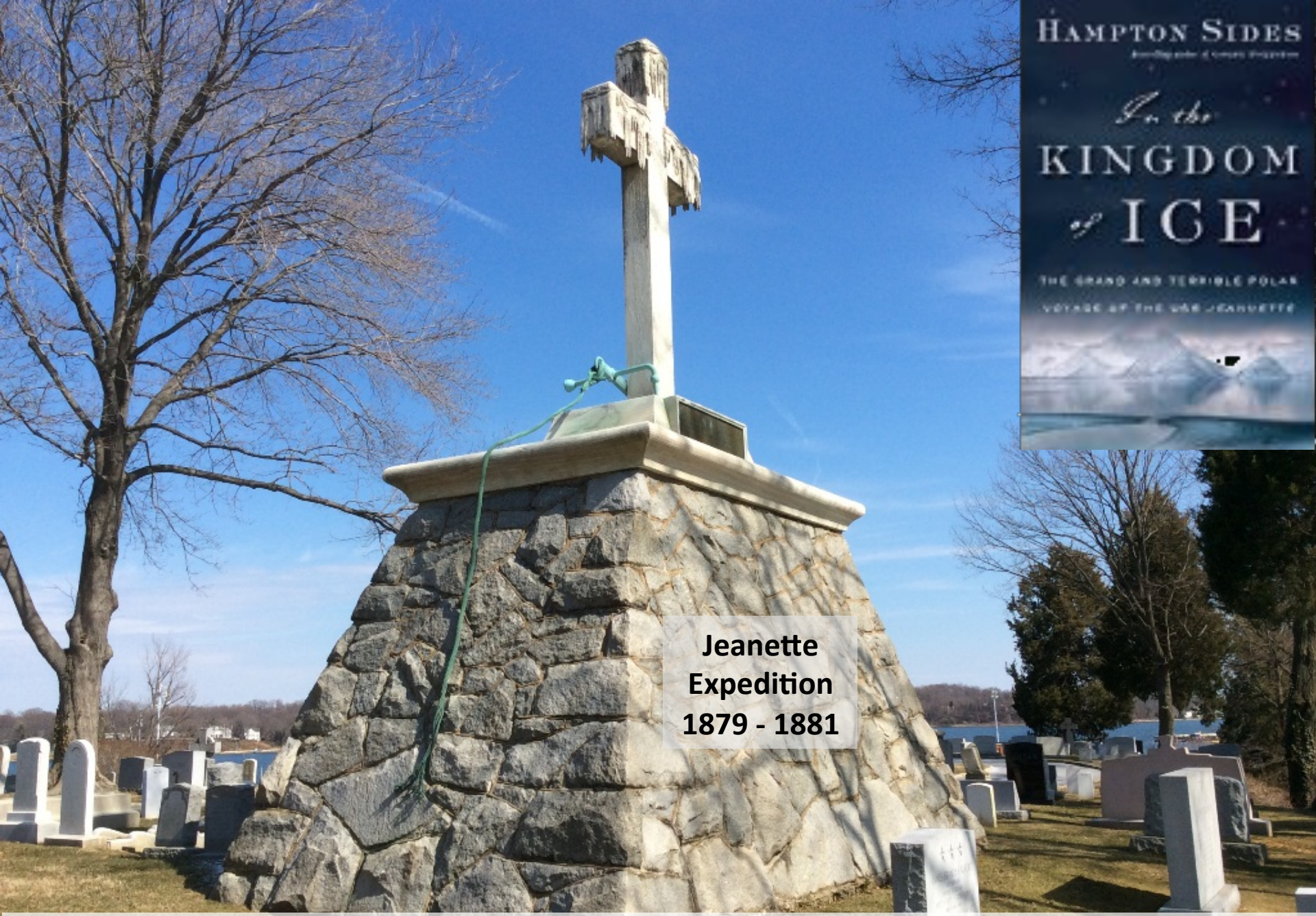
Increase Arctic capabilities by leveraging opportunities for mil-mil and gov-gov collaboration with Arctic partners through:

- **Improved Communication** & **Relationships** with Arctic Neighbors
- **Increased Cooperative Projects, Trainings, Operations** & **Exchanges** by Removing Obstacles

Partnerships

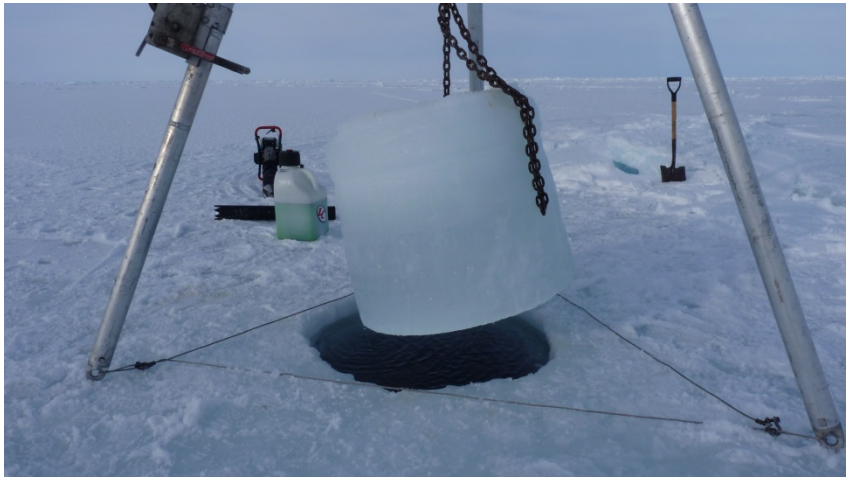
Navy Strategic Partnerships

- Assured Access
- Maritime Domain Awareness (MDA)
- Safety of Maritime Activities
- Search and Rescue (SAR)
- Law Enforcement
- Oil Spill Response

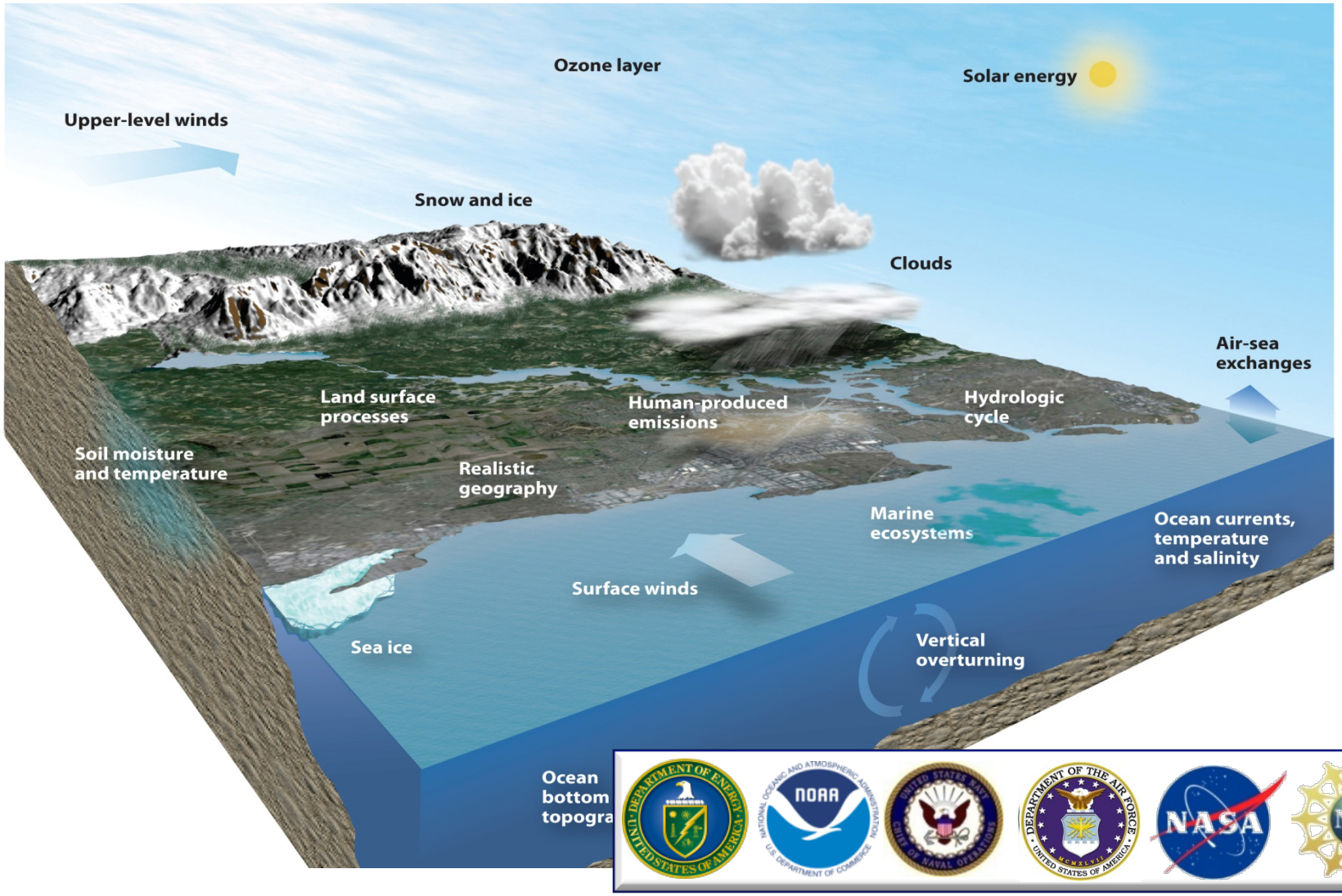


The U.S. Navy has a long history in the Arctic

ICEX 2014



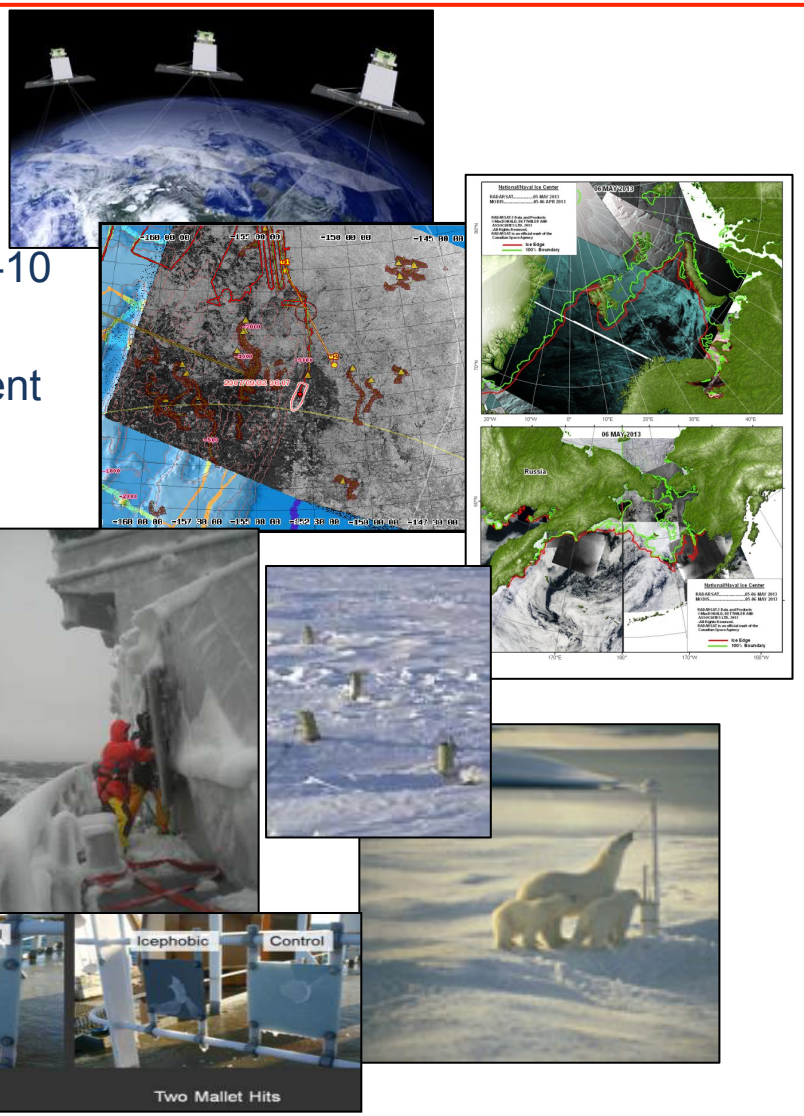
Earth System Prediction Capability (ESPC)
0 hours → 30 years: Weather, Ocean, Climate, Ice



ESPC: A unifying NATIONAL effort → one "BEST" operational "model"

Enablers

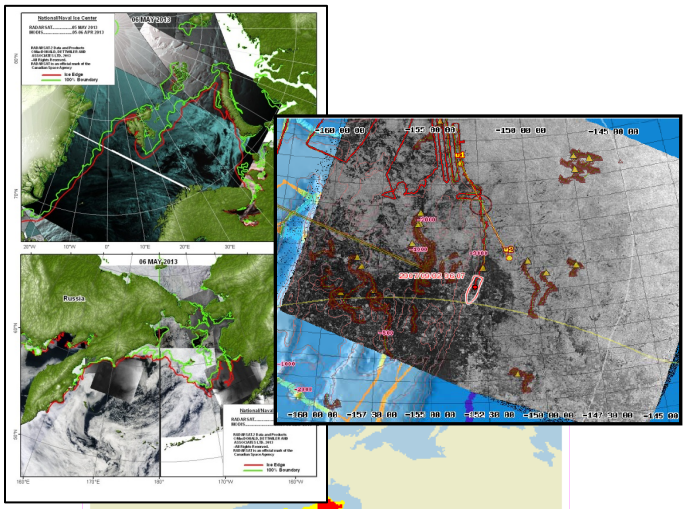
- **Improved Sea Ice & Weather Forecasts**
- **High-Resolution Arctic System Models**
  - Coupled ocean/wave/ice/atmosphere
- **Expanded Forecasts** (7 days, 1-3 months, 1 yr, 5-10 yrs)
  - Detailed ice location, thickness, age, movement
- **Platform & Sensor Development** (buoys, hydrographic sensors, UAV/UUVs)
- **Earth System Prediction Capability** (ESPC)
- **Improved Charting**



Improving forecasts and predictions to support Navy operations

Roadmap to Improved Arctic Forecasting Capability

Analyze: Ice edge position and MIZ extent



Predict:

ESPC Regional Arctic Coupled Model FY 2022

Predict:

2 week sea ice forecast (location, thickness, age & movement) + 30/60/90 day Outlook

International Collaboration

Task Force Climate Change

Ensure informed decisions for policy development and naval operations

TFCC efforts include:

- Strategic Guidance Development
- Advocacy across DoD
- Investment Strategy
- Inter-agency & International Partnerships

Photo Credit: Master Sgt. Ken Hammond, USAF